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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/993,388	11/14/2001	Mark M. Wang	267/006	4938

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EXAMINER
JOHNSTON, PHILLIP A

ART UNIT	PAPER NUMBER
2881	

DATE MAILED: 07/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/993,388	WANG ET AL.	
	Examiner	Art Unit	
	Phillip A Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 April 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-16* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

Detailed Action

Examiners Response to Arguments

1. Applicants arguments are moot in view of new grounds for rejection.

Claims Rejection – Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-16 of Application No. 09993388 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-43 of copending Application No. 09845245. Although the conflicting claims are not identical, they are not patentably distinct from each other because it is obvious to one of ordinary skill in the art that most of the limitations in Claims 1-16 of Application No. 09993388 are contained in the above copending Application No.

09845245. By way of example, a comparison of Claim 1 of Application No. 09993388, with Claims of the copending Application No. 09845245 is included below.

(Currently Amended) Claim 1, of Application No. 09993388, read as follows: An apparatus for collecting optically sorted particles comprising: a first surface adapted to support a plurality of particles, an optical illumination system for subjecting the particles to a moving optical gradient field to cause the selective separation of at least a portion of the particles away from the surface, and a second adhesive surface for adhering at least a portion of the separated particles to the second surface.

(New) Claim 11, of Application No. 09993388, read as follows: A method of sorting particles comprising the steps of: providing a volume defined by a first surface and a second surface, the volume containing a plurality of particles, disposed adjacent to the first surface, the second surface comprising an adhesive surface; providing an optical illumination system having a moving optical gradient field; moving the optical gradient field in a direction towards the second surface so as to cause the selective separation of at least a portion of the particles away from the first surface such that at least a portion of the separated particles adheres to the second surface.

Claims 1-3, 16 and 26 of Application No. 09845245, read as follows;

Claim 1. A method for the characterization of a particle comprising the steps of: observing a first physical position of a particle; optically illuminating the particle to subject it to an optical force, observing the second position of the particle, and characterizing the particle based at least in part upon reaction of the particle to the optical force.

Claim 2. The method of Claim 1 wherein, the optical illumination includes an optical gradient field.

Claim 3. The method of Claim 2 wherein, the optical gradient field is a moving optical gradient field.

Claim 16. A method for analyzing particles comprising the steps of: electrokinetically moving the particles, and subjecting the particles to optical forces for sorting.

Claim 26, The method of claim 16 wherein the mechanical separation utilizes a capture structure.

It is obvious to one of ordinary skill in the art that all the limitations in Claims 1-16 of Application No. 09993388, are for the most part, contained in Claims 1-43 of Application No. 09845245.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims Rejection – 35 U.S.C. 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Original Claims 1-9 and newly added Claims 10-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,055,106, to Grier et al, in view of Zarling et al, U.S. Patent No. 6,399,397.

Regarding Claims 1-66, Grier (106) discloses a prior art optical tweezer system 10 of FIG. 1,wherein the optical gradient forces arise from use of a single beam of light 12 to controllably manipulate a small dielectric particle 14 dispersed in a medium 16 whose index of refraction, n_m, is smaller than that of the particle 14. The nature of the optical gradient forces is well known, and also it is well understood that the principle has been generalized to allow manipulation of reflecting, absorbing and low dielectric constant particles as well. Any of these techniques can be implemented in the context of the invention described hereinafter and will be encompassed by use of the terminology optical tweezer, optical trap and optical gradient force trap hereinafter.

In the optical tweezer system 10 either static or time dependent diffractive optical elements 40 can be used. For a dynamic (moving optical gradient), or time dependent version, one can create time changing arrays of the optical traps 50 which can be part of a system utilizing such a feature. In addition, these dynamic optical elements 40 can be used to actively move particles and matrix media relative to one another, as recited in Claim 1. For example, the diffractive optical element 40 can be a liquid crystal phase array undergoing changes imprinted with computer-generated holographic patterns.

In another embodiment illustrated in FIG. 5, a system can be constructed to carry out continuous translation of the optical tweezer trap 50. A gimbal mounted mirror 60 is placed with its center of rotation at point A. The light beam 12 is incident on the surface of the mirror 60 and has its axis passing through point A and will be projected to the back aperture 24. Tilting of the mirror 60 causes a change of the angle of incidence of the light beam 12 relative to the mirror 60, and this feature can be used to translate the resulting optical trap 50. A second telescope 62 is formed from lenses L3 and L4 which creates a point A' which is conjugate to point A. The diffractive optical element 40 placed at point A' now creates a pattern of diffracted beams 64, each of which passes through point A to form one of the tweezer traps 50 in an array of the optical tweezers system 10. See Column 3, line 20-32; and Column 5, line 12-36.

Grier (106) discloses nearly all the limitations of Claims 1-16, but does not disclose the use of a second adhesive surface for adhering at least a portion of the separated particles to the second surface. Zarling (397); however, discloses an apparatus for optical cell sorting, where wick D2 wicks up a portion of a sample fluid D8, which is suspected of containing the target antigens. Target antigens bind to the antibodies present at a capture surface D9. Capture surface D9 is positioned at the focal point of source D3. The target antigens can be labeled with phosphor-antibody conjugates either before or after capture. In the preferred embodiment wick D2 is formed of glass. In this configuration capture surface D9 is prepared simply by filling the inside of the capillary with a bubble containing the antibodies of interest. By silanizing the inner surface with organofunctional silanes, conventional chemistries can

be used to covalently link the antibodies or other biological macromolecule(s) to the inner tube wall at the site of the liquid bubble. The surface energy of the capillary is also easy to modify by silanization, which will help prevent nonspecific reagent and antigen adherence to the walls of the tube. See Column 39, line 8-24.

Therefore it would have been obvious to one of ordinary skill in the art that Grier's (106) optical trapping apparatus and method can be modified to use the analyte adhesion technique in accordance with Zarling, to capture or collect the separated particles for use in further analytical and diagnostic applications.

Conclusion

6. The Amendment filed on 4-15-2003 has been considered but the arguments are moot in view of new grounds for rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip A Johnston whose telephone number is 305 7022. The examiner can normally be reached on 7:30 to 4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R Lee can be reached on 703 308 4116. The fax phone numbers for the organization where this application or proceeding is assigned are 703 872 9318 for regular communications and 703 872 9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308 0956.

PJ

June 18, 2003

JOHN R. LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800